

Remarks

Favorable reconsideration of this application is respectfully requested in view of the above amendments and following remarks. Independent claims 1, 8, 15, and 20 have been amended, and are supported for example in Figs. 31-35 and 46-52 and corresponding descriptions in the specification. Dependent claims 17 and 25 are amended to be consistent with revisions to the independent claims. Claims 16, 18, 19, and 26 are canceled without prejudice or disclaimer. Claims 27-30 are added and also are supported by the original disclosure. Claims 1-15, 17, 20-25, and 27-30 are pending.

Claim Rejections- 35 U.S.C. §112

Claims 15-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Applicants respectfully request that this rejection be withdrawn.

Claim 15 recites a projection on the outermost side of the attachment portion of the cap. Claim 15 and its remaining dependent claims are definite.

Claim 20 has been amended to remove the language "said compressing being by said forming" from the claim. Claim 20 and its remaining dependent claims are definite.

Favorable reconsideration and withdrawal of the objection is respectfully requested.

Drawings

The drawings are objected to for not showing every feature recited in the claims. Applicants respectfully request this objection to be withdrawn for at least the following comments.

The drawings are objected to because the feature of the split-line and the centerline being separated by approximately 90 degrees is not shown. Applicants respectfully submit that an angle, for example angle 822 of Fig. 31 and angle 852 of Fig. 48, is generally shown in the drawings and described in the specification for example, at page 15, lines 24-26 and at page 17, lines 2-4. Further, original claims 3 and 10 disclose that the split-line and the centerline may be separated by an angle of approximately 90 degrees. To further address this issue, Applicants have listed the originally disclosed features of claims 3-5 and 10-12 into the specification at the paragraph on page 15, line

21 to page 16, line 2. Applicants respectfully request that the objection to this feature be withdrawn.

The drawings are also objected to because the feature of the shank having the projections is not shown. Applicants respectfully propose adding Fig. 53 to show the feature clearly disclosed at page 21, lines 18-27 of their original disclosure. Applicants respectfully submit that no new matter is added by Fig. 53, as the same projection structure 830 of the cap 820 (see e.g. Fig. 31) is illustrated (as 830A), but is instead shown on the shank (810A). In fact, there is a clear basis for the projection structure on the shank as it is described in detail at page 21, lines 18-27 of the originally filed specification, and which explicitly states “[a]lthough what has been shown and described is a cap with projecting ears that are a press fit against mating surfaces of the shank, the present invention also contemplates those embodiments in which the ears project from the shank toward the cap, and these ears of the shank press laterally against flanged surfaces of the cap. For at least these reasons, Applicants respectfully submit that the objection be withdrawn as to this feature.

Favorable reconsideration and withdrawal of the objection is respectfully requested.

Claim Rejections- 35 U.S.C. 103

Claims 1-7 and 15-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holtzberg et al. (US 4,458,555) in view of Santi (US 5,243,878). Applicants respectfully traverse the rejection.

Claim 1 is directed to a connecting rod, and includes among other features a shank with a pair of laterally facing surfaces disposed at outermost sides of the shank, a cap with a pair of projections that slidably receive therebetween in an interference fit the laterally facing surfaces, and wherein the interference fit enabling the projections of the cap to compress the laterally facing surfaces of the shank from the outermost sides of the shank.

Claim 15 is directed to an apparatus for an internal combustion engine with a crankshaft and a cylinder with a reciprocating piston located therein, and includes among other features a projection that provides an interference fit between the cap and the shank that enables the projection to compress the shank from an outermost side of the shank, so

as to resist shear forces acting along the angled-split plane between the attachment portion of the cap and the attachment portion of the shank.

Claim 20 is directed to a method for attaching a connecting rod to a crankshaft of an internal combustion engine, and includes among other features the step of compressing with projections of one of the shank or the cap around the crankpin the other of the shank or the cap where said compressing produces an interference fit between said cap and said shank, said interference fit enabling said projections to compress one of said shank and said cap from an outermost side of the connecting rod.

Applicants respectfully submit that the combination of Holtzberg et al. and Santi do not disclose or suggest the features of the claims for at least the following reasons. Applicants acknowledge the deficiencies of Holtzberg stated in the Office Action, and respectfully submit that Santi does not remedy such deficiencies. Santi does not disclose or suggest the projection structure or interference fit features thereof as recited by claims 1, 15, and 20, namely where the interference fit enabling the projections of the cap to compress the laterally facing surfaces of the shank from the outermost sides of the shank (see claim 1), or likewise where a projection that provides an interference fit between the cap and the shank that enables the projection to compress the shank from an outermost side of the shank (see claim 15), or a step of compressing projections of one of the shank or the cap, where the compressing produces an interference fit enabling the projections to compress one of said shank and said cap from an outermost side of the connecting rod (see claim 20).

Rather, Santi discloses an entirely different structure showing a key 38 and groove 39 on respective joint surfaces 28, 30 of a cap member 18 and crankpin bearing portion 16, which are used for aligning the cap member and crankpin bearing portion on the respective joint surfaces (see Col. 4, lines 1-10). However, the key and groove structure of Santi does satisfy the projection and interference structure of the claims, for example where the projection(s) have the interference fit that enables the projection to compress from outermost sides of the shank (claims 1 and 15) or connecting rod (claim 20). Rather, the key and groove of Santi is at best questionable as an interference fit structure that provides compressive effect from an outermost side. In fact, Santi discloses that during assembly the material forming walls 40-43 deform and permit an initial press fit assembly for the cap member and crankpin bearing portion (see Col. 4, lines 19-22).

As the walls of the key and groove deform, there is no suggestion that Santi's structure would satisfy the projection/interference features of the claims (e.g. compressive effect). Further, Santi merely discloses that the key and groove structure only permit an initial press fit assembly and nothing more. Consequently, the structure in Santi cannot be assumed to teach the projection/interference features of the claims when the cap and shank are connected to a crankpin. Even further, the 'wedging action' of the key and groove structure in Santi would be localized, such that there is two-sided interference of each groove in relation to its respective key, which does not satisfy an interference fit and compression at outermost sides as claimed. Also Santi provides his structure on the axial interface between his cap member and crankpin bearing portion (i.e. not on lateral side surfaces). Santi's key and groove is an alignment feature and not an ongoing interference fit connection. The claimed invention, however, recites a projection/interference structure with compressing action from outermost sides of the shank or connecting rod, and is a completely different structure from Santi. Consequently, claims 1, 15, and 20 do not follow from Holtzberg et al. and Santi.

Moreover, the features of claims 1, 15, and 20 can provide advantages, such as resisting shear forces that tend to occur along an angled-split plane between the cap and shank. When using connecting rods with angled-split line configurations, sheer forces tend to increase on fasteners that may be used to hold the cap onto the shank, and which sheer forces can cause fretting of the interface between the cap and the shank (see e.g. Applicants specification at page 15 line 29 to page 16 line 2). Holtzberg merely shows a traditional split-line configuration (not angled) and Santi fails to teach, suggest, or even recognize such an issue or how to address it.

For at least the foregoing reasons, Applicants respectfully submit that claims 1, 15, and 20 and their respective dependent claims are patentable over the references cited. Favorable reconsideration and withdrawal of the objection is respectfully requested.

Claims 8-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taguchi (US 6,027,784). Applicants respectfully traverse the rejection.

Claim 8 is directed to an apparatus for an internal combustion engine with a crankshaft and a cylinder and a reciprocating piston located within the cylinder, and includes among other features, a shank with a pair of projections, a cap with a pair of

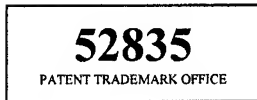
laterally facing surfaces at outermost sides of the cap, the projections slidably receive therebetween in an interference fit the laterally facing surfaces, and wherein the interference fit enabling the projections of the shank to compress the laterally facing surfaces of the cap from the outermost sides of the cap. Claim 8 has similar features as in claim 1, but with the projections on the shank rather than the cap, such that the cap is compressed rather than the shank. Claim 20 has been described in detail above.

Applicants respectfully submit that Taguchi et al. does not disclose or suggest the features of at least claims 8 and 20 for at least the following reasons. Applicants acknowledge the deficiencies of Taguchi et al. mentioned in the Office Action, and respectfully request that the rejection be removed for at least those reasons. However, the detailed comments of this rejection further include a discussion of Santi, which is not part of the statement of the rejection, saying that Santi teaches the interference structure and angled-split line features. Santi's shortcomings have been detailed above. Applicants respectfully submit that, even if Santi is combined with Taguchi et al. which Applicants are not conceding is correct, the combination fails to disclose or suggest claims 8 and 20 for many of the same reasons mentioned above. For example, Santi does not disclose a projection/interference fit structure with features that compress from outermost sides. Thus, claims 8 and 20 and their respective dependent claims do not follow from these references, and Applicants respectfully submit that remaining claims 8-15, 17, 20-25 are patentable.

Favorable reconsideration and withdrawal of the objection is respectfully requested.

Regarding added dependent claims 27-30, Applicants respectfully submit that these claims recite features that are patentable for the same reasons specified above, but also include features that are separately patentable.

In view of at least the foregoing amendments and remarks, Applicants believe that this application is in a condition for allowance. A Notice of Allowance is respectfully solicited. If any questions arise regarding this communication, the Examiner is invited to contact Applicants' representative at the number listed below.

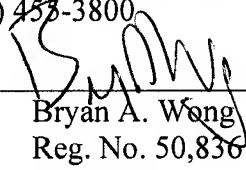


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